

Understanding regime changes using statistical physics — from deep neural networks to democratic nations

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Statistical physics provides us with powerful tools to understand processes outside of physics. In particular, the study of complex systems benefits from the statistical viewpoint and the associated physics phenomenology. I will present two examples from my group's work. Example one is the transition from non-learning to learning in a deep neural network which exhibits the properties of a phase transition. I will present our explanation of this 'phase' transition in terms of geometric features of the 'model' space. Example two is the transition from democratic to non-democratic or autocratic political regime types in the history of the 20th century. We have explored and quantified these transitions using tools from diffusion physics and random walks. I will present the results and link them to known historical events.

References

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